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STATE OF MISSOURI  
**DEPARTMENT OF NATURAL RESOURCES**

Matt Blunt, Governor • Doyle Childers, Director

www.dnr.mo.gov

June 15, 2005

CERTIFIED MAIL – 7003 0500 0002 3724 0270  
RETURN RECEIPT REQUESTED

Mr. Joseph Haake  
Group Manager  
The Boeing Company  
Dept. 464C, Bldg. 220  
Mail Code S221-1400  
P.O. Box 516  
St. Louis, MO 63166-0516



RE: Boeing's Resource Conservation and Recovery Act Total Petroleum Hydrocarbon (TPH)  
Soil Vapor Sampling Work Plan (SVWP) Hazelwood, Missouri, EPA ID# MOD00818963

Dear Mr. Haake:

The Missouri Department of Natural Resources' Hazardous Waste Program (HWP) has reviewed the March 11, 2005, SVWP and provides the following comments:

- 1) Section 2.3 – This section states that only one sampling event is planned which is scheduled to occur in late winter, 2005. All soil gas sampling guidance that the HWP is aware of suggests that one sampling event is not sufficient to evaluate the indoor air pathway. The HWP has recently finalized a soil gas sampling protocol for petroleum storage tanks, which is being incorporated into the Missouri Risk-Based Corrective Action (MRBCA) technical guidance. This document can be found on our website at:  
<http://www.dnr.mo.gov/alpd/hwp/mrbca/tanks-files/soil-gas-protocol-final-2005-04-21.pdf>.  
This document states that a minimum of two sampling events scheduled at least three months apart is necessary, and that four sampling events spaced three months apart is preferable. Depending on site conditions, two sampling events can be sufficient, if a warm and a cold season sample have been taken. The protocol states that sampling less than the recommended four times must be approved in advance by the HWP's project manager for the site. If the data from those two events appears to fluctuate greatly, then additional sampling can be required.



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The Soil Gas Sampling Protocol also states that two samples should be taken from each sampling location. One sample can be sufficient if the depth to groundwater is less than five feet, but if groundwater is deeper than that, two samples need to be taken from each sampling location. Please revise the SVWP to include additional sampling events as well as additional samples from each probe location.

- 2) Section 3.0 - Because of the need for repeated sampling from the same location, the HWP recommends installing permanent probes, wells, or other soil gas sampling devices to allow for the assessment of the seasonal variability at a given sampling location. Temporary sampling points, such as through the probe rods of a direct push drill machine may be used, although care needs to be taken to ensure that the same sampling location is reproduced. If temporary points are used, the location and depth of temporary sampling points must be accurately and durably recorded. It is also recommended that the location of each sampling point be recorded using Global Positioning System (GPS) coordinates. Please refer to the above-mentioned Soil Gas Sampling Protocol document for more in-depth guidance. Please revise the SVWP to include methods for durably marking sampling locations and consider the use of permanent sampling locations.
- 3) Section 3.2 - When sampling from probes installed using the direct push method, soil gas sampling should not be conducted for at least 30 minutes following probe installation. Please include a provision for waiting to sample from each location for a minimum duration of 30 minutes.
- 4) Section 3.2 - A regulated flow meter should be placed between the probe and the sample container to control and measure the flow rate. An initial sampling rate of 200 milliliters per minute (mL/min) or less is recommended. Please revise the SVWP accordingly.
- 5) Section 3.2 - Boeing states that seven volumes of vapor will be purged prior to sample collection. The foregoing guidance recommends that three to five volumes be purged, and that purging over five volumes can increase the uncertainty in the location of the collected sample, and in turn, greater the potential that atmospheric air might have been drawn down the outside of the probe. Please either change the purge volume or further explain the reasoning for selecting the purge volume proposed in the SVWP.
- 6) Section 3.2 - Soil Gas sampling should generally not be conducted within 48 hours of a significant precipitation event (.5 inch or greater of rain). While the majority of the Boeing site is paved, there is potential for soils under the pavement to become wetted through cracks and joints in the pavement. For this reason, please include an acknowledgement in the SVWP which specifies that sampling will not be conducted within 48 hours of a significant precipitation event.

Mr. Joseph Haake  
June 15, 2005  
Page 3

- 7) Section 5.0 - The HWP requires the use of Quality Control Samples. The collection of at least one field duplicate per sampling event or one per twenty samples, which ever is greater, is required. Also, at least one equipment blank must be collected per sampling event or per 25 samples, which ever is greater. Please revise the SVWP accordingly.

Please revise and resubmit the SVWP within 30 days of receipt of this letter. If you have any questions concerning this comment letter or require any additional information, please do not hesitate to contact me at the Missouri Department of Natural Resources, HWP, P.O. Box 176, Jefferson City, MO 65102-0176, or by phone at (573) 751-3553.

Sincerely,

HAZARDOUS WASTE PROGRAM



Jill K. Bruss  
Environmental Engineer  
Permits Section

JKB:mj

c: Ms. Joletta Golik, Airport Authority  
Ms. Stephanie Doolan, U.S. EPA, Region VII ✓  
St. Louis Regional Office